



Transportation Synthesis Report

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Overweight Permits and Superloads

Prepared for
**Bureau of Technical Services
Division of Transportation System Development**

Prepared by
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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WisDOT technical staff in highway development, construction and operations. Online and print sources include NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs, and related academic and industry research. Internet hyperlinks in TSRs are active at the time of publication, but changes on the host server can make them obsolete.

Request for Report

The Wisconsin Department of Transportation operates a comprehensive oversize/overweight permit program providing for safe, efficient movement of oversize/overweight vehicle and loads with minimal impact on infrastructure. The department is receiving a growing number of requests for permits to operate exceptionally heavy trucks of 400,000 lbs. or more on state roadways. The RD&T Program was asked to report on procedures used by infrastructure staff in other Midwest DOTs for assessing and processing requests for overweight permits. Information regarding any software used for analyzing loads and impact on roadways would be especially helpful. The findings will be used to help formalize WisDOT's procedure for permitting exceptionally heavy loads.

Summary

We identified seven state DOTs – including four in the Midwest – that have developed formalized procedures or impact analysis tools for permitting “Superloads” – exceptionally heavy or large vehicles. The states are:

- Colorado: Permit requests for loads exceeding 200,000 lbs. are directed to engineers in CDOT's Staff Bridge Branch Rating Unit for review, which has developed software tools to expedite analyses and turnaround to the trucking industry.
- Illinois: Superload permit requirements address the assessment and adjustment of underground utilities by utility companies, and placement of earthen or crushed stone padding to protect pavement.
- Indiana: INDOT's Superload Permit Section utilizes the Overload Routing System and Bridge Analysis and Rating System to evaluate applications for permits.
- Kansas: The Kansas Trucking Connection, a partnership involving the Kansas DOT, posts a 12-point checklist on its Web site of ways that customers can help expedite the Superload permit process.
- Michigan: MDOT Transport Permits Unit policy stipulates that an overweight permit will not be issued for a vehicle when any wheel load exceeds 700 lbs. per inch of tire width; permits are approved for empty self-propelled earth moving equipment that does not exceed 850 lbs. per inch of tire width.
- Ohio: Topics addressed in ODOT's *Operational Guide for Vehicles Operating with an Oversize/Overweight Special Hauling Permit* include the minimum vehicle configuration for Superload movement. “Non load equalizing, air lift and combination air/mechanical groupings are not acceptable. Close groupings of three and four axle combinations at high group weights have been shown to have the potential to damage certain type structures and generally are not permitted.”
- Western Association of State Highway and Transportation Officials: The WASHTO *Guide for Uniform Laws and Regulations Governing Truck Size and Weight Among the WASHTO States* identifies recommended procedures for the approval process for Superloads, specific size and weight criteria for each member state's Superload determination, and a sample form that may be used to notify other states of proposed moves.

Colorado

Load Rating and Permit Vehicle Routing

Mark Nord, Colorado Department of Transportation

George Hovey, InMotion, Inc.

http://gulliver.trb.org/publications/circulars/circ498/v2_K05.pdf.

(From: Presentations from the 8th International Bridge Management Conference

Transportation Research Circular 498, Vol. 2, June 2000

<http://gulliver.trb.org/publications/circulars/circ498/circular498.pdf>.)

Colorado DOT, through an agreement with InMotion, Inc. of Denver, has developed an automated Windows-based PC system (FASTRACS) for issuing permits for most of the 100,000+ extralegal load requests Colorado receives each year. Permit requests for loads more than 200,000 lbs. are sent to, and reviewed by, engineers in CDOT's Staff Bridge Branch Rating Unit. Over the years, the department has developed tools to help expedite analyses and provide faster turnaround to the trucking industry. Some of these tools have been incorporated into the automated system. This paper describes the automated system, the enhancements to the system currently being worked on, the current method of reviewing overload requests (less than and greater than 200,000 lbs.), and the future automation for loads more than 200,000 lbs. Highlights include:

*** Tools (PDF page 9) –**

Based on approved extralegal loads greater than 200,000 lbs., most extralegal permit requests were discovered to be 13 or fewer axles. Extending the Colorado allowable axle group configurations to 13 axles led to the definition of the Super Load Truck (Exhibit 13). Using operating level ratings based on the Super Load truck as a measure of relative liveload capacity, the number of structures analyzed during a typical extralegal permit request has dropped and better control and repeatability of the extralegal permit process has been achieved.

*** Future Directions (PDF page 9) –**

FASTRACS allowed the partial automation of the permit process for loads less than 200,000 lbs. Extending automation to the loads greater than 200,000 lbs. is the Rating Unit's future direction. The motivation for automating the processing of extralegal permit requests greater than 200,000 lbs. is the roughly three-fold increase in approved loads within Colorado over the past 10 years (Exhibit 14). The intended elements of the automation are an electronic tie between the unit's work process and the permit office, an automated structure selection process, a partially automated approval process for typical extralegal permit requests (13 or fewer axles); and an automated system for tracking extralegal permit requests.

Illinois:

Title 92: Transportation

Chapter I: Department of Transportation; Subchapter f: Highways

Part 554: Oversize and Overweight Permit Movements on State Highways

<http://www.dot.state.il.us/road/ooindex.html>.

Highlights include:

*** Subpart F: Overweight Vehicles and Loads**

<http://www.dot.state.il.us/road/ooindexf.html>;

Section 554.610: Movement of Exceptionally Large Equipment

<http://www.dot.state.il.us/road/subpartf.html#610>.

These movements characteristically involve a great deal of advance planning and analysis. The objects being moved may weigh several hundred thousand pounds or more and can be moved under their own power or may be loaded on special transporting equipment. Typical loads include power shovels or draglines used in strip mining operations, reactor vessels or generators used in power plants, or other extremely heavy industrial equipment components. These movements are generally for very short distances on or across a highway. In addition to the general provisions applicable to normal overdimension and overweight movements, one or more of the following conditions may apply.

a) Due to the lengthy pavement and bridge analyses required for exceptionally heavy loads, a special agreement regarding payment of inspection and investigation fees in accordance with Section 554.910(b) may be necessary (See below- Subpart I: Fees).

b) The effect of the movement on overhead and underground utilities must be determined by the utility companies. Any adjustments required, such as raising lines or rerouting underground facilities are to be made in advance of the movement.

- c) Movement may be restricted to when the shoulders are dry and firm, frozen, or have bearing capacity to support the object being moved or the weight of other passing traffic.
- d) Movement may be restricted to periods when the probability of precipitation is no more than 30 percent as predicted by the National Weather Service.
- e) An earthen or crushed stone pad of a depth specified by the Permit Office may be required to protect the pavement.
- f) Additional insurance or security may be required in accordance with Sections 554.108 or 554.905 (<http://www.dot.state.il.us/road/subparti.html#905>).
- g) A special agreement between the permittee and the department may be required to ensure all conditions are defined regarding the security and repair requirements as specified in Section 554.910(b).

*** Subpart I: Fees**

<http://www.dot.state.il.us/road/ooindexi.html>;

Section 554.910: Fee for Engineering Inspections and Investigations

<http://www.dot.state.il.us/road/subparti.html#910>.

b) For unusually large movements that may require extensive analyses, inspections and investigations by department personnel, a written agreement will be executed by the applicant and the department as to the extent of special charges. The following rates will be utilized unless otherwise stipulated.

- 1) Bridge structural analysis - \$40 per hour.
- 2) Pavement structural analysis - \$40 per hour.
- 3) Field investigations of movement feasibility, for each department employee - \$40 per hour.
- 4) Accompanying the move, for each department employee - \$40 per hour.
- 5) Interim or final inspections, for each department employee - \$40 per hour.
- 6) Computer usage time will be at the rate charged to the department by the Department of Central Management Services.

Indiana

INDOT Oversize and/or Overweight Superload Permits

<http://www.in.gov/dot/business/permits/superl.html>.

Items of interest include:

*** What is the "Bridge" Program?**

<http://www.in.gov/dot/business/permits/superl.html#What is the Bridge program>

Most bridges today are designed using a typical design vehicle known as "HS-20." This is a vehicle configuration that has been developed by AASHTO and is thought to be an adequate design for the majority of actual vehicles using city streets and state highways. With this design vehicle, the "bending moment" or the stress is already known for different bridge span lengths. The INDOT "Bridge" program will, upon entering the customer's vehicle axle weights and axle spacings, calculate the stresses caused by the vehicle, compare those stresses to the stresses caused by an HS-20 design vehicle, and calculate an "equivalent HS rating" for the customer's vehicle. An equivalent HS rating of 29.99 or more will necessitate the use of Superload Special Provision # 12. An equivalent HS rating of 40 or more will cause the permit application to be submitted to B.A.R.S., regardless of the total gross weight.

*** What are O.R.S. and B.A.R.S.?**

<http://www.in.gov/dot/business/permits/superl.html#What is O R S and B A R S>.

O.R.S. (Overload Routing System) and B.A.R.S. (Bridge Analysis and Rating System) are computer programs used daily in the INDOT Superload Permit Section. The programs are used in conjunction with one another. O.R.S. is a Paradox-based application used to create a data file and printout of all bridges being crossed by a particular vehicle using the applicant's requested route. That data file, along with the axle weights and axle spacings of the vehicle, is submitted to B.A.R.S., which performs a detailed structural analysis on every bridge that will be crossed, using the actual vehicle configuration of the permitted vehicle. Once the program has finished and the output has been analyzed, one of four conditions will apply to each bridge on the route: a) No Restriction- the bridge may be crossed at the maximum allowable speed with no restrictions; b) One Lane Distribution- bridge must be crossed at the maximum allowable speed, traveling in the center of the travel lanes while alone on the structure; c) Slowdown- the bridge must be crossed at a reduced speed, traveling in the center of the travel lanes while alone on the structure; or d) Failure- the bridge may not be crossed by this particular vehicle.

A Superload permit clerk will call the customer after the analysis has been completed to relay the results. Any bridges to be crossed as One Lane Distributions or Slowdowns are faxed to the customer along with their locations. A traffic control letter, stating how traffic will be controlled at these locations, will be required from the customer's

company prior to permit issue. The customer is also notified if any of the bridges failed the B.A.R.S. analysis. If so, the customer may either try a different route, or try a different vehicle configuration (decreasing the axle weights and/or increasing the axle spacings). In either case, the permit application will need to be run again through O.R.S. and B.A.R.S.

B.A.R.S. analysis is automatically required for any permit application for a vehicle with total gross weight in excess of 200,000 lbs., or for any vehicle for which the Bridge program returns an equivalent HS rating of 40 or more. The customer should allow an additional three to five days for processing, and the company will be expected to pay O.R.S. fees in addition to the permit fee (see Permit Fees, below).

*** What is the Telephone Superload Program?**

http://www.in.gov/dot/business/permits/superl.html#What_is_the_Telephone_Superload_progra.

The Telephone Superload program has been developed in order to process certain Superload permits more efficiently and allow companies to obtain their permits expeditiously. This program has been designed for vehicles with known configurations and dimensions that are permitted frequently and that do little damage to the state highways and bridges. This program is open to companies with an established method of payment (either through a permit service or having checks or credit card on file with the Indiana Department of Revenue), whose vehicles meet the following criteria: height less than or equal to 13.5 ft., width less than or equal to 16 ft., length less than or equal to 110 ft., total gross weight less than 200,000 lbs. The vehicle configuration will be entered into the Bridge program for calculations. Only those vehicles with an equivalent HS rating of 29.49 or less will be allowed to participate in the Telephone Superload program.

*** Permit Fees**

http://www.in.gov/dot/business/permits/superl.html#Permit_Fees.

Oversize Superload permits consist of a \$30 flat fee. Overweight Superload permits consist of a \$20 base fee plus a mileage-distance charge based on the total gross weight, plus a \$25 design review fee. In addition, all Superload applications are subject to a \$10 executive approval fee. Unlike O.R.S. fees, these fees are included as part of the permit fee. See immediately below for the mileage charge which applies:

Total Gross Weight	Cost per mile
Less than or equal to 108,000 lbs.	\$0.35 per mile
108,001 lbs. to 150,000 lbs.	\$0.60 per mile
Greater than 150,000 lbs.	\$1.00 per mile

Oversize and Overweight Superload permits are charged the greater of the cost of the oversize permit fee or the overweight permit fee. For overweight Superload applications requiring B.A.R.S. processing, there is an O.R.S. fee of \$10 per structure analyzed. This fee is not included with the customer's permit fee; customers are billed separately for this. For vehicles which fail the B.A.R.S. analysis on the first attempt and are re-routed, the fee is reduced to \$5 per structure for each subsequent attempt. Failure to pay the O.R.S. fees will result in the company being placed on violation, thereby preventing the customer from obtaining any oversize/overweight permits in Indiana.

Overview of New Oversize/Overweight Vehicle Permitting System

Indiana Department of Revenue, Motor Carrier Services Division

<http://www.in.gov/dor/mcs/permitting-overview.html>.

The "Superload Pre-approval" feature will expedite I.D.O.R. permit approval for many Superload haulers: pre-approval will be good for 30 days, enabling them to obtain additional permits using the same vehicle configuration without any additional INDOT analysis or delay.

Kansas

Kansas Trucking Connection

<http://www.ksdot.org/burTrafficEng/KTC/default.asp>.

The Kansas Trucking Connection (KTC) is a partnership involving the Kansas DOT, the Kansas Department of Revenue, and the Kansas Corporation Commission. The group's mission includes consolidating the regulatory requirements of the trucking industry in Kansas, and providing a single point of contact for haulers and other customers seeking information about the requirements.

Truckin' Through Kansas (revised July 2005)

<http://www.truckingks.com/ttk.htm>.

This online booklet is produced by the KTC. Highlights include:

* Section 36-1-38: Types of Permits

http://www.truckingks.com/ktc_page13.htm.

(c) Superload permits

These permits allow the movement of overweight loads that exceed 150,000 lbs. of gross weight.

- 1) Movers of Superloads shall pay for all damages caused by the movement of the Superload.
- 2) Movers of Superloads shall have a valid Superload permit that includes a bridge analysis, which must be completed by the department before traveling on any highway within Kansas.
- 3) Superload permits shall be issued only for single-trip movements.
- 4) Before escorting Superloads within Kansas, escorting companies shall obtain certification in a manner approved by the secretary.

Kansas Trucking Connection: Superload Information

<http://www.ksdot.org/burTrafficEng/KTC/Applications/SuperloadInformation.asp>.

Scroll to: Things customers can do to shorten the time it takes to complete a bridge study –

This section suggests 12 ways in which customers can assist in the processing of Superload permit requests to help expedite the process.

Michigan

Information on the Movement of Oversize or Overweight Vehicles and Loads

(T-2) May 2004

Transport Permits Unit

http://www.michigan.gov/documents/MDOT_MoveOS_OW_T2_92127_7.pdf.

Conditions and Limitations:

E. (page 2) – A request for an overweight permit will not be approved for a load consisting of more than one object, and in no event, shall any wheel load exceed 700 lbs. per inch of tire width. However, permits will be approved for empty self-propelled earth moving equipment provided it does not exceed 850 lbs. per inch of tire width.

Ohio

Operational Guide for Vehicles Operating with an Oversize/Overweight Special Hauling Permit

Ohio DOT Special Hauling Permit Section, January 1995

<http://www.dot.state.oh.us/permits/PDFs/opgd2.pdf>.

Items of interest include:

* Minimum Vehicle Configuration for Superload Movement. No less than an eight or nine axle "west coast" configuration consisting of a three axle tractor; two axle jeep; two axle trailer on one or two axle stinger or booster, depending on weight. The weight must equalize over the axles and axle groups. Non load equalizing, air lift and combination air/mechanical groupings are not acceptable. The close groupings of three and four axle combinations at high group weights have been shown to have the potential to damage certain type structures and generally are not permitted.

* Second Review- Note. Vehicles/loads in the superload category may be considered for movement only from the place of manufacture/port of entry to the final site of installation/port/state line with no intermediate destinations such as warehouse, display, etc.

* Escrow Account. Haulers may be required to open an escrow account in an amount determined sufficient to cover the expense of O.D.O.T. field technician escorts. Determination of the amount will take into account bridge analysis results, length of the move and number of days required to complete movement in Ohio.

Ohio DOT Office of Structural Engineering, Bridge Management Section

Structural Rating Group (SRG)

<http://www.dot.state.oh.us/srg/Default.htm>.

SRG's mission includes analyzing structures for safe load carrying capacity, and advising the Office of Permits and Communications about whether it is safe for Superloads (120,000 lbs. to 800,000 lbs. gross load) to cross state structures. SRG's primary goals are to maintain two days or less turnaround on Superloads, and to analyze at least 25 structures per month. The group's four, full-time staff also provide R&D support to implement new technology to the load rating and Superload analyses.

Western Association of State Highway and Transportation Officials

Guide for Uniform Laws and Regulations Governing Truck Size and Weight Among the WASHTO States

Adopted by the WASHTO Policy Committee June 2004 (updated May 2005)

http://www.wsdot.wa.gov/freight/mcs/pdf/WASHTO_2005.pdf.

Section 1.28 (page 5): A Superload is any load that would require special approval by one or more state permit offices because of dimensions or weight. The guidelines contained in this manual reflect maximum size and weight limits for routine issuance of permits. Loads in excess of the stated guidelines would require additional coordination between industry representatives and state officials. Additionally, loads that do not exceed the Superload guidelines may also require special approval by individual states.

Chapter 5.00 (page 21): Superloads. The chapter identifies recommended procedures for the approval process for Superloads, specific size and weight criteria for each state's Superload determination, and a sample form that may be used to notify other states of proposed moves.